CLAIMS

1. An integrated circuit, comprising:

one or more components that receive a distributed voltage;

a voltage driver that produces a compensated voltage, the compensated voltage being distributed to form the distributed voltage at the one or more components, wherein the distributed voltage is degraded relative to the compensated voltage; and

wherein the voltage driver is responsive to feedback derived from the distributed voltage to adjust the compensated voltage so that the distributed voltage is approximately equal to a nominal voltage.

2. An integrated circuit as recited in claim 1, wherein said one or more components have input characteristics that contribute to the degradation of the distributed voltage.

3. An integrated circuit as recited in claim 1, wherein said distribution contributes to the degradation of the distributed voltage.

4. An integrated circuit as recited in claim 1, wherein:

said distribution contributes to the degradation of the distributed voltage; and

the compensated voltage is distributed over impedance-matched conductors to form the distributed voltage at the one or more components.

5. An integrated circuit as recited in claim 1, wherein said one or more components comprise data receivers that evaluate data signals relative to the distributed voltage.

6. An integrated circuit as recited in claim 1, further comprising a feedback component that evaluates the distributed voltage relative to the nominal voltage to derive said feedback.

7. An integrated circuit as recited in claim 1, wherein:

said one or more components have input characteristics that contribute to the degradation of the distributed voltage at the data receivers;

further comprising a feedback component that evaluates the distributed voltage relative to the nominal voltage to derive said feedback, wherein the feedback receiver has input characteristics similar to those of the one or more components to contribute similar degradation to the distributed voltage at the feedback component.

8. An integrated circuit as recited in claim 1, wherein:

the integrated circuit further comprises a feedback component that evaluates the distributed voltage relative to the nominal voltage to derive said feedback;

said distribution contributes to the degradation of the distributed voltage; and

the distributed voltage is routed to result in similar degradations at the one or more components and the feedback component.

9. An integrated circuit as recited in claim 1, further comprising:

a feedback component that evaluates the distributed voltage relative to the nominal voltage to derive said feedback;

wherein the voltage driver has a variable gain that is configured to increase in response to the feedback when the distributed voltage is less than the nominal voltage and to decrease in response to the feedback when the distributed voltage is greater than the nominal voltage.

10. An integrated circuit as recited in claim 1, wherein the voltage driver has a variable gain that is controlled by a digital value.

11. An integrated circuit as recited in claim 1, wherein the voltage driver has a variable gain that is controlled by a digital value, the integrated circuit further comprising a register that is configurable to store the digital value and to provide the digital value to the voltage driver.

12. An integrated circuit as recited in claim 1, wherein the voltage driver has a variable gain that is controlled by a digital value, the integrated circuit further comprising a register that is configurable to store the digital value and to provide the digital value to the voltage driver, the register being readable and writable.

13. An integrated circuit as recited in claim 1, wherein the voltage driver has a variable gain that is controlled by a digital value, further comprising a counter that produces the digital value, wherein the counter is responsive to the feedback to increment and decrement the digital value.

14. An integrated circuit as recited in claim 1, wherein the voltage driver has a variable gain that is controlled by a digital value, further comprising a counter that produces the digital value, wherein the counter is responsive to the feedback during an initialization period to increment and decrement the digital value, the digital value remaining constant during an operational period following the initialization period.

15. An integrated circuit as recited in claim 1, wherein the integrated circuit comprises a memory device.

16. An integrated circuit as recited in claim 1, wherein the integrated circuit is a memory device that further comprises a plurality of memory storage cells.

17. An integrated circuit, comprising:

a one or more data receivers that evaluate one or more corresponding data signals relative to a distributed reference voltage;

a reference voltage driver that produces a compensated reference voltage, the compensated reference voltage being distributed to form the distributed

reference voltage, wherein the distributed reference voltage is degraded relative to the compensated reference voltage; and

wherein the reference voltage driver has a variable gain that increases when the distributed reference voltage is less than a nominal reference voltage and decreases when the distributed reference voltage is greater than the nominal reference voltage.

18. An integrated circuit as recited in claim 17, wherein the reference voltage driver is configured so that its gain is set during an initialization period and remains constant during a subsequent operational period.

19. An integrated circuit as recited in claim 17, wherein the variable gain is controlled by a digital value.

20. An integrated circuit as recited in claim 1, wherein the variable gain is controlled by a digital value, the integrated circuit further comprising a register that is configurable to store the digital value and to provide the digital value to the reference voltage driver.

21. An integrated circuit as recited in claim 1, wherein the variable gain is controlled by a digital value, the integrated circuit further comprising a register that is configurable to store the digital value and to provide the digital value to the reference voltage driver, the register being readable and writable.

22. An integrated circuit as recited in claim 17, wherein the variable gain is controlled by a digital value, further comprising a counter that produces the digital value, wherein the counter increments or decrements the digital value depending on the relationship of the distributed reference voltage relative to the nominal reference voltage.

23. An integrated circuit as recited in claim 17, wherein the variable gain is controlled by a digital value, and the integrated circuit further comprises a counter that produces the digital value, wherein the counter is configured to increase and decrease the digital value during an initialization period depending on the relationship of the distributed reference voltage and the nominal reference voltage, the digital value remaining constant during an operational period following the initialization period.

24. An integrated circuit as recited in claim 17, further comprising a capacitive charge pump that controls the gain of the reference voltage driver.

25. An integrated circuit as recited in claim 17, further comprising a feedback component that evaluates the distributed reference voltage relative to the nominal reference voltage to generate a feedback signal, the reference voltage driver being response to the feedback signal to increase and decrease the variable gain.

26. An integrated circuit as recited in claim 17, further comprising:

a feedback component that evaluates the distributed reference voltage relative to the nominal reference voltage to generate a feedback signal;

a charge pump that produces a control voltage to establish the gain of the reference voltage driver;

the charge pump being responsive to the feedback signal to increase and decrease the variable gain.

27. An integrated circuit as recited in claim 17, wherein the compensated reference voltage is distributed over impedance-matched conductors to form the distributed reference voltage at the one or more data receivers.

28. An integrated circuit as recited in claim 17, further comprising:

a feedback component that evaluates the distributed reference voltage relative to the nominal reference voltage to generate a feedback signal, the reference voltage driver being response to the feedback signal to increase and decrease the variable gain;

wherein the feedback component incorporates a low-pass filter.

29. An integrated circuit as recited in claim 17, wherein the one or more data receivers comprise a plurality of the data receivers, and wherein the data receivers have similar input characteristics and the distributed reference voltage is routed similarly to each of the data receivers to result in similar degradation of the distributed reference voltage at each of the data receivers.

30. An integrated circuit as recited in claim 17, further comprising:

a feedback receiver that evaluates the distributed reference voltage relative to the nominal reference voltage to generate a feedback signal, the reference voltage driver being response to the feedback signal to increase and decrease the variable gain;

wherein the data and feedback receivers have similar input characteristics and the distributed reference voltage is routed similarly to the data and feedback receivers to result in similar degradation of the distributed reference voltage at the data and feedback receivers.

31. An integrated circuit as recited in claim 17, further comprising:

a feedback receiver that evaluates the distributed reference voltage relative to the nominal reference voltage to generate a feedback signal, the reference voltage driver being response to the feedback signal to increase and decrease the variable gain;

wherein the data and feedback receivers have similar input characteristics and the distributed reference voltage is routed similarly to the data and feedback receivers to result in similar degradation of the distributed reference voltage at the data and feedback receivers; and

wherein the feedback receiver incorporates a low-pass filter that does not significantly affect the input characteristics of the feedback receiver.

32. An integrated circuit as recited in claim 17, wherein the integrated circuit is a memory device that further comprises a plurality of memory storage cells.

33. An integrated circuit, comprising:

a plurality of data receivers that evaluate corresponding data signals relative to a distributed reference voltage;

a feedback receiver that evaluates the distributed reference voltage relative to a nominal reference voltage to produce a feedback signal;

a reference voltage driver that produces a compensated reference voltage, the compensated reference voltage being routed on the integrated circuit to form the distributed reference voltage at the data and feedback receivers, wherein the input characteristics of the data and feedback receivers cause a voltage change in the distributed reference voltage at each receiver relative to the compensated reference voltage;

the data and feedback receivers having similar input characteristics so that said relative voltage change in the distributed reference voltage is approximately the same at each of the data and feedback receivers;

an increment/decrement component that produces a digital value in response to the feedback signal, the increment/decrement component being configured to increment and decrement the digital value depending on the relationship of the distributed reference voltage and the nominal reference voltage as indicated by the feedback signal; and

wherein the reference voltage driver has a variable gain that is established by the digital value.

34. An integrated circuit as recited in claim 33, wherein the compensated reference voltage is distributed over impedance-matched conductors to form the distributed reference voltage at the data and feedback receivers.

35. An integrated circuit as recited in claim 33, wherein the increment/decrement component is enabled during an initialization period and the digital value remains constant during a subsequent operational period.

36. An integrated circuit as recited in claim 33, further comprising a register that is configurable to store the digital value and to provide the digital value to the reference voltage driver.

37. An integrated circuit as recited in claim 33, further comprising a register that is configurable to store the digital value and to provide the digital value to the reference voltage driver, the register being readable and writable.

38. An integrated circuit as recited in claim 33, further comprising a digitally controllable variable resistor that controls the gain of the reference voltage driver.

39. An integrated circuit as recited in claim 33, wherein the feedback receiver comprises a low-pass filter that does not significantly affect the input characteristics of the feedback receiver.

40. An integrated circuit as recited in claim 33, wherein the distributed reference voltage is routed similarly to the data and feedback receivers so that said relative voltage change in the distributed reference voltage is approximately the same at each of the data and feedback receivers.

41. An integrated circuit as recited in claim 33, wherein:

the distributed reference voltage is routed similarly to the data and feedback receivers so that said relative voltage change in the distributed reference voltage is approximately the same at each of the data and feedback receivers; and

the feedback receiver comprises a low-pass filter that does not significantly affect the input characteristics of the feedback receiver.

42. An integrated circuit as recited in claim 33, wherein the integrated circuit is a memory device that further comprises a plurality of memory storage cells.

43. An integrated circuit, comprising:

receiver means for evaluating a plurality of data signals relative to a distributed reference voltage;

feedback means for evaluating the distributed reference voltage relative to a nominal reference voltage to produce a feedback signal;

driver means having a variable gain for producing a compensated reference voltage;

routing means for routing the compensated reference voltage on the integrated circuit to form the distributed reference voltage at the receiver and

feedback means, wherein the input characteristics of the receiver and feedback means cause a voltage change in the distributed reference voltage at the receiver and feedback means relative to the compensated reference voltage;

the receiver and feedback means having similar input characteristics so that said relative voltage change in the distributed reference voltage is approximately the same at each of the receiver and feedback means; and

gain control means for controlling the gain of the driver means in response to the feedback signal so that the distributed reference voltage is approximately equal to the nominal reference voltage.

44. An integrated circuit as recited in claim 43, wherein the gain control means comprises a counter that produces a digital value, wherein the counter is responsive to the feedback to increment and decrement the digital value.

45. An integrated circuit as recited in claim 43, wherein the gain control means comprises a register that is configurable to store a digital value, the variable gain of the driver means being responsive to the digital value.

46. An integrated circuit as recited in claim 43, wherein the gain control means comprises a register that is configurable to store a digital value, the variable gain of the driver means being responsive to the digital value, the register being readable and writable.

47. An integrated circuit as recited in claim 43, wherein the compensated reference voltage is distributed over impedance-matched conductors to form the distributed reference voltage at the receiver and feedback means.

48. An integrated circuit as recited in claim 43, wherein the gain control means is enabled during an initialization period to adjust the gain of the driver means, wherein the gain control means is configured to maintain the gain of the driver means constant during a subsequent operational period.

49. An integrated circuit as recited in claim 43, wherein the gain control means comprises a digitally controllable variable resistor.

50. An integrated circuit as recited in claim 43, wherein the distributed reference voltage is routed similarly to the receiver and feedback means so that said relative voltage change in the distributed reference voltage is approximately the same at each of the receiver and feedback means.

51. An integrated circuit as recited in claim 43, wherein:

wherein the distributed reference voltage is routed similarly to the receiver and feedback means so that said relative voltage change in the distributed reference voltage is approximately the same at each of the receiver and feedback means; and

the feedback means comprises a low-pass filter that does not significantly affect the input characteristics of the op-amp.

52. An integrated circuit as recited in claim 43, wherein the integrated circuit is a memory device that further comprises a plurality of memory storage cells.

53. A memory device comprising:

a plurality of memory storage cells;

a plurality of data receivers that evaluate binary data signals with reference to a distributed reference voltage;

a feedback receiver that evaluates the distributed reference voltage relative to a nominal reference voltage to produce a feedback signal;

a reference voltage driver that produces a compensated reference voltage, the compensated reference voltage being routed on the memory device to form the distributed reference voltage at the data and feedback receivers, wherein the input characteristics of the data and feedback receivers cause a voltage change in the distributed reference voltage at each receiver relative to the compensated reference voltage;

the data and feedback receivers having similar input characteristics so that said relative voltage change in the distributed reference voltage is approximately the same at each of the data and feedback receivers; and

wherein the reference voltage driver has a variable gain that is configurable to increase in response to the feedback signal when the distributed reference voltage is less than the nominal reference voltage and to decrease in response to the feedback signal when the distributed reference voltage is greater than the nominal reference voltage.

54. A memory device as recited in claim 53, wherein the compensated reference voltage is distributed over impedance-matched conductors to form the distributed reference voltage at the data and feedback receivers.

55. A memory device as recited in claim 53, wherein the variable gain of the reference voltage driver is controlled by a digital value, the integrated circuit further comprising a register that is configurable to store the digital value and to provide the digital value to the reference voltage driver.

56. A memory device as recited in claim 53, wherein the variable gain of the reference voltage driver is controlled by a digital value, the integrated circuit further comprising a register that is configurable to store the digital value and to provide the digital value to the reference voltage driver, the register being readable and writable.

57. A memory device as recited in claim 53, wherein the gain of the reference voltage driver remains constant during an operational period that follows an initialization period.

58. A memory device as recited in claim 53, wherein the feedback receiver comprises a low-pass filter that does not significantly affect the input characteristics of the feedback receiver.

59. A memory device as recited in claim 53, wherein:

the distributed reference voltage is routed similarly to the data and feedback receivers so that said relative voltage change in the distributed reference voltage is approximately the same at each of the data and feedback receivers; and

the feedback receiver comprises a low-pass filter that does not significantly affect the input characteristics of the feedback receiver.

60. A method comprising:

evaluating a plurality of signals relative to a distributed voltage;

amplifying a nominal voltage by a variable gain to produce a compensated voltage;

routing the compensated reference voltage over resistive conductors to form the distributed voltage;

increasing the variable gain when the distributed voltage is less than the nominal voltage; and

decreasing the variable gain when the distributed voltage is greater than the nominal voltage.

61. A method as recited in claim 60, wherein the routing comprises routing the compensated reference voltage over impedance-matched resistive conductors to form the distributed voltage.

62. A method as recited in claim 60, further comprising:

maintaining the variable gain at a constant value during an operational period following an initialization period.